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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : Confirmation No. 8121
Kazuyuki NITTA et al. : Docket No. 2001_1143A
Serial No. 09/928,430 : Group Art Unit 1752
Filed August 14, 2001 : Examiner S. Lee

POSITIVE-WORKING PHOTORESIST
COMPOSITION AND RESIST
PATTERNING METHOD USING SAME

37 C.F.R. 1.131 DECLARATION

Assistant Commissioner for Patents,
Washington, D.C.

Sir:

Kazuyuki NITTA, Kazufumi SATO, Daisuke KAWANA, and Satoshi SHIMATANI declare:

1. That they are the joint inventors of the subject application;
2. That they are employees of Tokyo Ohka Kogyo Co., Ltd. of Tokyo, Japan, hereinafter TOK;
3. That they conceived the invention as presently claimed prior to the August 15, 2000 effective date of the Ohsawa et al. reference (US 6,440,634), cited in the Official Action of November 6, 2002;
4. That this prior conception was coupled with diligence from just prior to the August 15, 2000 effective date of the Ohsawa et al. reference until the August 31, 2000 filing date of Applicants' Japanese priority application 2000-264529;
5. That proof of such conception is set forth in the attached Budget Proposal prepared by Kazuyuki NITTA, the first named inventor herein, on behalf of himself and his co-inventors (Attachment A);
6. That this budget proposal Attachment A (in Japanese) is accompanied by a verified English translation thereof (Attachment B);

7. That attached to said Budget Proposal is an Outline of New Patent Application (Attachment C) which Outline was completed, forwarded to the Executive Board of TOK and approved by them prior to August 15, 2000;
8. That upon approval of the Budget Proposal and accompanying Outline of the New Patent Application, these materials were forwarded to Agata Patent Office prior to August 15, 2000 prepare the Japanese priority application which was filed on August 31, 2000;
9. That the attached materials evidence conception from the time just prior to the August 15, 2000 Ohsawa et al. effective date to the August 31, 2000 filing date of Applicants' Japanese priority application and diligence over this period of time is shown by the reasonable amount of time taken to prepare and file the Japanese application;
10. That in view of the foregoing, it is evident that Applicants conceived the present invention prior to the August 15, 2000 effective date of the Ohsawa et al. reference and acted with diligence from the period just prior to the effective date of this reference to the August 31, 2000 filing date of the Japanese priority application upon which the present application is based, which is a constructive reduction to practice;
11. That the foregoing also evidences an actual reduction to practice prior to the August 15, 2000 effective date of the Ohsawa et al. reference since the outline of new patent application (Attachment C) sets forth actual experimental work by Applicants prior to the effective date of the reference;
12. That in this regard, it can be seen from Example 1 of the Outline of New Patent Application (Attachment C), that all elements of the invention as presently claimed were conceived and actually reduced to practice at the time that the Outline (Attachment C) was prepared i.e. prior to August 15, 2000;

More specifically, in Example 1 on page 16 of Attachment C, there was prepared a positive-working resist composition prepared by dissolving in an organic solvent:

- (A) 100 parts by weight of a hydroxystyrene-based polymer which is a combination of:
 - (A1) a first polyhydroxystyrene resin having phenolic hydroxyl groups, a part of which are substituted for the hydrogen atoms thereof by acid-dissociable alkoxyalkyl groups i.e. 1-ethoxyethyl groups; and
 - (A2) a second polyhydroxystyrene resin having phenolic hydroxyl groups, a part of which are substituted for the hydrogen atoms by acid-dissociable groups selected from the group consisting of tertiary alkoxycarbonyl groups i.e. tert-butoxycarbonyl groups,

wherein the weight proportion of the first polyhydroxystyrene resin (A1) to the second polyhydroxystyrene resin (A2) is in the ratio of 3:1;

- (B) 5 parts by weight of a radiation-sensitive-acid-generating compound i.e. bis(cyclohexylsulformyl) diazomethane;
- (C) 5 parts by weight of a polyvinyl ether compound susceptible to crosslinking i.e. 1,4-cyclohexane dimethanol divinyl ether;
- (D) 0.1 part by weight of carboxylic acid consisting of atoms of carbon, oxygen and hydrogen alone, i.e. salicylic acid; and
- (E) 0.2 parts by weight of an amine compound i.e. triethylamine.

The photoresist is employed in the manner set forth in claim 11 of the present application, and claim 11 of the draft on page 3 of the Outline of the Patent Application, i.e. coating the surface of the substrate with the photoresist composition followed by drying to form a dried photoresist layer, exposing the dried photoresist layer on the substrate surface to pattern-wise light to form a latent image of the pattern and subjecting the photoresist layer after pattern-wise exposure to development e.g. as disclosed in steps (C) to (E), on page 14 of the Outline of New Patent Application;

That they further declare that all statements made herein of their own knowledge are true, and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

5/22/2003
Date

Kazuyuki Nitta
Kazuyuki NITTA

5/21/2003
Date

Kazufumi SATO
Kazufumi SATO

5/22/2003
Date

Daisuke KAWANA
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5/21/2003
Date

Satoshi SHIMATANI
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